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ABSTRACT

The review characterizes phases of compliance in the learning of a skill (acquisition of the skill, fluency, generalization) and details research which exemplifies behavior management strategies that have been endeavored at each phase. The implications of these findings are considered and cautions and considerations of discrete strategies are suggested. Differential approaches that are effective and pragmatic for establishing or enhancing compliance in varying populations, ranging from non-handicapped to severely and profoundly handicapped, are proposed, including differential social attention, token economy systems, and manipulation of antecedents. Six pages of references conclude the document. (Author/CL)

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THE STATUS OF COMPLIANCE TECHNOLOGY

Implications for Programming

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Running Head: Compliance Technology

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Abstract

Compliance is theoretically conceptualized as a skill to be developed along a learning gradient. This review characterizes learned phases of compliance and details research which exemplify behavior management strategies that have been endeavored at each phase. The implications of these findings are considered and cautions and considerations of discrete strategies are suggested. Differential approaches that are efficacious and pragmatic for establishing or enhancing compliance in varying populations, ranging from non-handicapped to severely and profoundly handicapped, are proposed.

The literature abounds with studies on the examination of methods and procedures to establish or enhance appropriate responding in noncompliant subjects. Appropriate responding requires following an instruction to perform a specific behavior within a reasonable and/or designated period of time. Conversely, noncompliance refers to failure to comply with an instruction and is noted if (a) no response is forthcoming at all, (b) no response is initiated within a pre-specified time limitation, or (c) some other, non-requested behavior is performed. Identified as a prevalent misbehavior in handicapped subjects (Wehman & McLaughlin, 1979), noncompliance presents parents, educators, and trainers with serious management problems ranging from an absence of control to faltering, uncertain control.

Researchers have characterized this phenomenon as disobedient behavior (Burchard & Barrera, 1972; Zeilberger, Sampen, & Sloane, 1968), negativistic behavior (Baer, Rowbury, & Baer, 1973; Wahler, 1969b), oppositional behavior (Scarboro & Forehand, 1975; Wahler, 1969a), and uncooperative behavior (O'Leary, Kaufman, Kass, & Drabman, 1970). Such terminology relates directly to the noncompliant subject. Other phrases (e.g., lack of instructional control and management control problems) apply to the reciprocal effect of noncompliance upon the instructor.

Compliance can be theoretically conceptualized as a skill to be developed along a continuum of phases, proceeding from acquisition to fluency and ultimately generalization. Differential technological approaches that are the most efficacious and pragmatic for use with varying populations may be extrapolated from a cumulative analysis of research techniques to date. This does not discount subjectivity in learner reaction, but rather suggests global recommendations for intervention at each phase.

This review characterizes the three phases of compliance and details research which exemplifies the programming that has been endeavored at each phase. Cautions

and considerations of the implementation of discrete strategies with varying populations, ranging from non-handicapped to handicapped, are discussed. Summative interpretations of the current compliance technology possibly extend those previously generated by Haring, White, and Liberty (1977) and provide a systematic perspective on the topic.

Acquisition of Compliant Responding

At the acquisition phase, the individual is learning the skill of appropriately responding to a request. The skill may not be demonstrated due to absolute unresponsiveness of the individual or genuine inability to comprehend the request. Haring et al. (1977) suggested a basic pattern of instruction: issue a command, allow a fixed time period in which the subject is to reply, and consequate compliant and noncompliant responding. Selection of the command requires deliberation, since each element may have long-range impact. Subjects may fixate on one portion of the instruction, responding only to a partial cue. Such selectivity may interfere with subsequent generalized instruction-following (Striefel, Bryan, & Arkins, 1974). Simple two to four word commands alone or in combination with a model of the desired behavior have constituted the premise for instruction in research evidencing successful results (Whitman, Zakaras, & Chardos, 1971; Striefel and Wetherby, 1973). Practically, a brief latency between request and response is necessary for management and control. Delayed responses interrupt continuity of events, requiring additional attention, prodding, and time. Researchers have designated latencies of 3, 4, 5, 10, 15, 20, or 30 seconds in which the child must respond before another trial is presented or the consequence for not responding is imposed (Haring et al., 1977; Striefel et al., 1974). The 5 second, 15 second, and 10 second interims were predominantly and respectively preferred in the present review. Further, contingent consequation of both compliance and noncompliance is supported in the literature. Ayllon and Azrin (1964) underscored

this by demonstrating the temporary effectiveness of unconsequated instructions. Contingent reinforcement in the form of immediate access to food and punishment in the form of slight delays in obtaining food were necessary to modify deviant behaviors in the 18 psychotic subjects of their study.

Research addressing the acquisition of appropriate responding adheres to this basic pattern of instruction. Lovaas, Schaeffer, and Simmons (1965) developed appropriate social behavior in severely retarded and autistic 5 year old twins by issuing the command "Come here," allowing a latency of 5 seconds, and consequating noncompliance with electrical shock and compliance with shock-avoidance. Simple instruction-following behavior was developed in severely and profoundly retarded children using less aversive techniques in studies by Whitman et al. (1971) and Striefel et al. (1973). Instructed in two to four word commands such as "Sit down," subjects responded within 15 and 5 seconds, respectively, before receiving social and primary reinforcers for compliance or physical guidance through the requested motor response for noncompliance. Employing similar means of consequation, Baer, Peterson, and Sherman (1967) and Striefel et al. (1974) incorporated a demonstration of the response with the verbal stimulus "Do this" to establish imitative responses in groups of severely and profoundly retarded subjects. Speech imitation was shaped within an experimental setting in a 5 year old, brain damaged child when termination of timeout from positive reinforcement was contingent upon desired sound production (McReynolds, 1969). Timeout in the form of removal from edible reinforcers, withdrawal of instructor attention, and quiet sitting for 30 seconds functioned to decrease inappropriate jargon, while ice cream and praise reinforced successively closer approximations of the terminal verbalization. The techniques of contingent social and primary reinforcement for compliance within a set period of time (e.g., 5 seconds), physical guidance for

motoric noncompliance or timeout for verbal noncompliance, and succinct commands have served as productive components in strategies to elicit compliant behavior in severely handicapped individuals at the acquisition phase of learning.

Fluency of Compliant Responding

Other research has focused upon the fluency phase of learning, attempting to increase compliance in subjects who could comprehend and perform the request but refused to do so consistently. Non-handicapped subjects have demonstrated sensitivity to the manipulation of differential social reinforcement involving contingent adult attention following desired child behaviors and removal of attention following undesired child behaviors. The examination of instructional control in a normal kindergarten classroom by Schutte and Hopkins (1970) supported the use of adult social attention to increase compliance. Appropriate responding to a command within 15 seconds rose 18% solely in the presence of teacher praise for these five girls. Contingent teacher praise was paired with teacher proximity to influence higher rates of compliance to a command within 30 seconds for a 3 year old child (Goetz, Holmberg, & Le Blanc, 1975). Yet, these same procedures failed to modify the noncompliance of two youngsters in a study employing parents as behavior managers (Wahler, 1969a). Oppositional behavior was only reduced under consequences involving 5 minute isolation in a bedroom for uncooperative behavior. Zeilberger et al. (1968) provided further examination of parental programming and implementation of behavioral contingencies similar to those required to actuate the desired response in the previous study. A 2 minute exclusionary timeout for noncompliance and reinforcement in the form of praise, new toys, or varied activities for compliance produced an average increase of 48% in the instruction-following behavior of one non-handicapped 4 year old boy.

More limited success has been met when the operant technique of differential attention has been applied to handicapped populations. Ayllon and Michael (1959)

decreased the aberrant behaviors of three out of five mental patients by pairing extinction with reinforcement of incompatible behaviors; however, this combination was unsuccessful with two subjects due to bootleg reinforcement (reinforcement maintaining the deviant behavior which is attributable to unknown or uncontrollable factors). In another study by Sajwaj, Twardosz, and Burke (1972), manipulation of a single behavior provoked changes in other, nonmanipulated behaviors. While the extinction procedure diminished excessive conversation in a 7 year old mentally retarded and emotionally disturbed boy, appropriate behavior at group academics declined and disruptions heightened during other activities. Desired levels of compliance were attained in young psychologically disturbed and developmentally delayed subjects only when timeout in conjunction with differential attention was instituted(Budd, Green, & Baer, 1976; Wahler, 1969b). Herbert, Pinkston, Hayden, Sajwaj, Pinkston, Cordua, & Jackson (1973) determined an inverse relationship between this technique and the management of aberrant behaviors in another group of mildly to severely handicapped youngsters. Data revealed increases in active noncompliance, argumentative verbalizations, and non-attending as well as the emergence of emotive side-effects (e.g., enuresis) in four of six subjects, which may in part be accounted for by the individual's learning that the same behavior was previously reinforced.

Discretion must be used in addressing the generality of subject responsivity to differential social reinforcement. This otherwise simple and naturalistic procedure has evoked undesired reactions in both non-handicapped and handicapped populations. Wahler (1969a) found unwavering levels of oppositional behavior regardless of differential parental attention in normal subjects. More aversive side effects of dangerous climbing, self-scratching, assaulting on parents, and increased disrupting in non-treatment activities, for examples, have been reported with handicapped populations (Herbert et al., 1973; Sajwaj et al., 1972).

While non-handicapped subjects have increased compliance in the presence of adult attention alone, this review of the literature has not disclosed examination of this procedure in isolation with handicapped subjects. Rather, more inclusive forms of behavior management (e.g., differential attention in combination with timeout) have been implemented to modify the noncompliance of handicapped individuals.

Another means of differential reinforcement, the token economy system, has demonstrated a powerful impact on the predictability of compliant behavior (Christophersen, Arnold, Hill, & Quilitch, 1972; O'Leary, Becker, Evans, & Saudergas, 1969b). "Tokens possess advantages over many other reinforcers because they may be distributed in classrooms conveniently and, because of their exchange power, are durable in their reinforcing quality"(Snell, 1978, p. 77). The behavior of nursery school children was brought under control through application of the Premack principle. Tokens earned for performing low probability classroom behaviors were later exchanged for opportunities to engage in high probability activities (Homme, De Baca, Devine, Steinhorst, & Rickert, 1963). In another study, five of seven second graders reduced noncompliance to rules/instructions, aggressive behavior, and inappropriate verbalization in response to tokens and back-up reinforcers of prizes and booklets (O'Leary et al., 1969b). Extending this treatment to the home, Christophersen et al. (1972) investigated the effects of a parent implemented token economy on the management of bothersome behaviors (e.g., noncompliance in performing household chores, bickering, and whining). Results indicated that one moderately mentally retarded and four normal subjects between the ages of 5 and 10 years decreased inappropriate verbal behaviors and increased performance of chores in response to earning naturally occurring privileges and activities.

Handicapped subjects, as well, have altered their behavior in response to token contingencies. Fifteen mildly to moderately retarded subjects evidenced significant decreases in error rate and disruptive behavior and increases in study

time when checkmarks and backup edibles, toys, and school supplies consequated desired behavior (Birnbrauer, Wolf, Kidder, & Tague, 1965). Application of a similar technique to a group of mildly to severely mentally retarded students sustained higher frequencies of instruction-following behavior in a study by Zimmerman, Zimmerman, and Russell (1969). Differential reinforcement of compliance with teacher invitations to perform a specific academic task modified the negativistic behavior of three special education preschoolers (Baer et al., 1973). Contingent access to free playtime, materials, and a snack, mediated by a token, produced greater diversity of task sampling by reinforcing contact with previously avoided instructional materials. Again, procedures involving token reinforcements exchanged for play periods and small toys effectively reduced the latency of responding to directional and organizational commands (e.g., "Put the work materials away") in an 8 year old emotionally disturbed boy (Fjellstedt & Sulzar-Azaroff, 1973). Failure to initiate a response within 15 seconds was consequated by physically guiding the subject through the desired response in this study.

The viability of employing a token economy system to modify noncompliance in populations ranging from non-handicapped to severely handicapped has been demonstrated. However, consideration must be given to the complexities of implementing a program that requires the delivery of tokens, the tally of tokens, the exchange of tokens, and the purchase of backups (Snell, 1978). Each component must be addressed in view of the individual's needs and abilities (e.g., reinforcing backups, counting skills). Attempting to simplify the token exchange component and promote less intrusive forms of reinforcement, researchers have found play periods in the school and personal privileges in the home to be sufficiently motivating exchanges for some subjects (Baer et al., 1973; Christophersen et al., 1972). Clearly the manageability and unobtrusiveness of the system

are primary issues to be deliberated prior to initiation.

Some subjects who have learned the generalized reinforcer value of tokens have responded to the punishment procedure of response cost. Response cost consequates noncompliance by contingently removing the token(s) from the subject. In a study by Gresham (1979), results supported the parsimonious use of a single technique, response cost, over the combined contingency of timeout plus response cost. Eleven educably mentally retarded youngsters reduced their unwillingness to comply to teacher commands within 5 seconds by approximately 37%. Higher values of response cost (e.g., 50 tokens rather than 5 tokens) for a misbehavior evidenced more suppressive value for mildly retarded adolescents (Burchard & Barrera, 1972). However, caution must be taken in indiscriminately affixing incremental penalties, as the degree of aversiveness may be dependent upon interactions within the specific environment or the previous exposure of the subject to reinforcement and punishment.

Social punishment has been the focus of other studies dealing with both non-handicapped and handicapped children. Quiet reprimands audible only to the reprimanded child revealed decreases in disruptive behaviors, whereas loud reprimands audible to all the children in the classroom only served to heighten levels of misbehavior in normal first and second graders (O'Leary & Becker, 1969a; O'Leary et al., 1970). In a comparative investigation of the separate effects of positive practice, timeout, and social punishment, Doleys et al. (1976) determined that the latter promptly produced decreased levels of noncompliance in four mentally retarded children. In this instance, however, social punishment involved a firm grasp of the subject's shoulders, a loud scolding reprimand, and a 40 second glare.

Implications for intervention to control noncompliance are seemingly in-

dicated in the form of mild social punishment for non-handicapped subjects and stern social punishment in lieu of other more complex forms of behavior management for handicapped populations. However, unconditional endorsement of this technique in its harsher forms has not been conceded due to the startle and emotive reactions it has elicited in some subjects.

Timeout, a more prevalent procedure for decreasing inappropriate behavior, refers to the contingent, relatively brief removal of an organism for a fixed time interval from contact with ongoing environmental contingencies (Plummer, Baer, & Le Blanc, 1977). In a large population of oppositional, nonclinic youths, 2 minutes of out-of-room or within-room timeout immediately suppressed noncompliance (Scarboro & Forehand, 1975). While both timeout procedures were equally effective, the within-room timeout required significantly more frequent application to deter opposition. In another large group of 16 severely and profoundly retarded male subjects, undesirable mealtime behaviors were reduced under contingent timeout procedures, operationally defined as removal from the meal for the entire period to a timeout room or removal of the food tray for 15 seconds, depending upon the subject's health (Barton, Guess, Garcia, & Baer, 1970). Yet in a study by Bostow and Bailey (1969), a brief 2 minute timeout was adequate to reduce the frequency of problem behaviors in two retarded institutionalized subjects in a short period of time.

With such diversity in timeout duration, the optimally effective length of removal is subject to inquiry. Timeout duration is a critical variable, since it may exclude the individual from instruction, increase the rate of aberrant behavior and elicit ethical concerns regarding the subjection of an individual to such aversize controls (White, Nielsen, & Johnson, 1972). Burchard and Barrera (1972) studied the effects of varying amounts of timeout in suppressing anti-

social behavior in six mildly mentally retarded institutionalized adolescents. While these researchers found a 30 minute timeout to yield greater decreases in deviant behaviors, others (White et al., 1972) determined that 15 and 30 minute timeouts produced equitable decreases in 20 moderately and severely retarded children. A significant finding of this latter study was the differential suppressive value of a 1 minute procedure. The earlier in the sequence of consequences the 1 minute timeout was instituted, the more powerful its effect. Such evidence suggests that a hierarchy of duration should prevail, wherein a brief timeout is initially imposed and duration augmented upon failure to effect desired change. For while handicapped populations have promptly responded to the use of timeout in modifying noncompliance as well as other aberrant behaviors, this form of contingency is readily subject to abuse.

Failure to decelerate noncompliance through reinforcement may necessitate the use of the aforementioned procedures of response cost, reprimand, and timeout or more intrusive consequences which exercise physical manipulations or controls over the subject. Physical guidance is an assistance procedure in which the interventionist manually leads the child through the desired response. At the acquisition phase of establishing compliant behaviors, this technique primarily serves to teach the subject the correct response, while in subsequent phases, it may actually function as a negative consequation, enforcing compliance upon an unwilling subject. Haring et al. (1977) achieved stimulus control with three severely handicapped subjects when compliance to a command within 5 seconds was praised and noncompliance resulted in the experimenter physically guiding the subject through the behavior.

Overcorrection entails putting the person through a series of physical movements that either restore the environment to its previously undisrupted state

or require the practice of alternative, constructive behaviors (Gaylord-Ross, 1980). Foxx (1977) used functional movement training, instructing and manually guiding the head positions of up, down, and straight, upon failure to make eye contact within 5 seconds of the request. Three autistic and severely mentally retarded children increased their eye contact to 90% when edibles and social praise for compliance were paired with overcorrection for noncompliance. Positive practice overcorrection was found to be more effective in reducing speaking out or leaving seats without permission than warnings, reminders, reinforcement, or loss of recess in six emotionally disturbed boys (Azrin & Powers, 1975). In this case, positive practice was defined as recitation of the correct procedure for talking in class or leaving one's seat and enactment of the procedure.

In an investigation of techniques to control and eliminate aberrant responses in severely retarded women, Mithaug (1979) reported the effectiveness of neck pressure and tapping in producing shorter response latencies than verbal praise/physical prompt or verbal praise/squirt of juice. These aversive physical manipulations elicited compliance by either tapping the subject's hand, arm, back, and neck or applying finger and thumb pressure to the sides of the subject's neck until a correct response was evoked.

Relevant to the use of physical punishment procedures are the inherent perplexities which tenuate their use. Practically, physical correction may not easily be applied in all settings. Infringing upon the movement and comfort of another person can set the stage for contention. Procedurally, these control techniques require significant time to execute, depriving other class members of instruction. Further, successive encounters can develop the subject's tone and strength and require increased effort on the part of the manager. Ethically, selection of aversive procedures is warranted only after reinforcement and other

less intrusive consequences have been exhausted. Still, while justification can be documented, legal restrictions may inhibit their use. More recently, programmatic concerns have been raised, challenging the practicality of strategies employed solely to manage behavior and endorsing a redress of skill building as the primary objective (Gaylord-Ross, 1980). By teaching and reinforcing competing, desirable behavior and manipulating antecedent events, it is purported that secondary manifestations of curtailed aberrant behaviors may result.

Research addressing the issue of noncompliance has concentrated upon the manipulation of consequential events to the neglect of antecedent controls on behavior. While consequences function to accelerate or decelerate behavior, antecedents facilitate and elicit desired behaviors (Berman, 1973). Therefore, antecedents may indeed provide a vehicle by which skills are developed and misbehaviors concurrently reduced.

The behavioral impact of one antecedent, instruction, has spurred recurrent investigation. Baron, Kaufman, and Stauber (1969) conducted experiments to determine whether instructions about contingencies had the same behavioral effect as actual exposure to the same contingencies. Eighteen college students operated machines under differing schedules of fixed interval reinforcement. Instructions about contingencies functioned to produce differential responding in one group, while an absence of instructions about contingencies resulted in imprecise responding in the other group. The researchers concluded that instructions can have major influence upon the establishment and maintenance of behavior. In recent years, a particular characteristic of instruction, pace, has been the subject of investigation. Carnine (1976) correlated fast and slow rates of teacher presentation to differences in the percentage of off-task behavior, correct answering, and participation in a reading program. A fast rate presentation involved a 1 second

or less delay between student response and subsequent questioning, while slow rate presentation allowed at least a 5 second delay. The faster rate evidenced greater decreases in the occurrence of off-task behavior and increases in correct answering and participation for both non-handicapped first grade subjects.

Handicapped children have likewise altered their behavior when paced instructions have been used to elicit desired responses. In a review of two single subject experiments involving 5 year old special education preschoolers, Plummer et al. (1977) found paced instruction (i.e., delivery of instructions to the child at a set pace regardless of the child's behavior) in conjunction with reinforcement to reduce inappropriate playing and eating behaviors to near zero, while timeout maintained or increased such behavior. Schoen (Note 1) compared the differential effects of increasing, decreasing, and maintaining the pace of instruction on the noncompliance of a severely multihandicapped child. Responding to teacher requests within 5 seconds was elevated from a baseline level of 60% to 100% under the condition involving increased commands paced at 1 minute intervals. Unconditionally paced commands issued at a naturally occurring rate plus contingent consequation effected behavior in the desired direction, but to a significantly lesser degree. Conversely, decreasing commands by using a self-cuing device served to heighten noncompliance. The implication of this and the preceding studies, that antecedents possess substantial controlling influence on the compliant behavior of handicapped and non-handicapped subjects, warrants further investigation. Antecedent management, once empirically supported, would have the advantage over traditional behavior modification approaches by not requiring additional treatment programs or consequence events, but rather, normal instructional sessions could be conducted with adaptations built into the ongoing curriculum (Gaylord-Ross, 1980).

Generalization of Compliant Responding

Any behavioral change, regardless of the manipulative procedure which evoked it, must demonstrate durability and flexibility to be functionally effective: durability, in that it needs to be maintained across time; and flexibility, in that it needs to occur across different settings, people, and behaviors. For a change in behavior in the training situation alone reveals only the adequacy of the intervention program to effect results under stringent conditions. It is the generalization of that behavior which ultimately reflects the comprehensive ability to perform the behavior in the absence of direct intervention.

The issue of generalization is commonly addressed in the literature on compliance training. Earlier studies sought to document generalization of imitative responses and interpret its occurrence. Waxler and Yarrow (1970) examined the imitative ability of 37 normal preschool children in a laboratory setting. Compliance to imitate motor movements within 4 to 5 seconds after the model was established using contingent social reinforcement. Imitation was then developed for novel, unreinforced responses when they were interspersed among those reinforced. Performance generalized to new experimenters, but decreased when the activity contexts changed. The effects of noncontingent reinforcement resulted in differential subject responding, with boys prolonging their rate of imitation for a female model and girls immediately suppressing imitation. Researchers concluded that limitations inherent in the experimental procedures confounded extrapolation of generalization processes, but that variables specific to the situation of an adult requesting a behavior could result in generalized imitation.

Baer et al. (1967) showed that three profoundly retarded subjects could generalize responses to a variety of stimuli when sufficient exemplars were trained. All subjects reached near perfect or perfect levels of imitative performance within a 10 second time limitation under the reinforcement condition of food and praise

and the physical guidance procedure. When new, unreinforced imitations were introduced, all responding remained at high levels as long as some other imitative responses were reinforced. Authors interpreted these results as an illustration of conditional reinforcement in which similarity between the subject's and model's behavior functioned to maintain generalized imitation.

Martin (1971) extended the research on generalized imitation to determine whether unreinforced imitations could be maintained when interspersed among reinforced, nonimitative behavior. Two severely retarded subjects upheld imitations when direct commands alone were reinforced with food. Two others upheld responses to direct commands when imitative behaviors were reinforced. When differential reinforcement of behaviors other than the targeted ones was introduced, responding diminished significantly. Martin concluded that both imitative and nonimitative responses are types of instruction-following behavior and therefore, form a response class that is under the control of adult direction.

In a progressive analysis of generalization, Striefel et al. (1974) studied the transfer of instructional control from imitative commands to direct commands. For each of 25 commands, a verbal instruction followed by a modeled prompt was provided. Soda, candy, or music reinforced correct responses within 5 seconds, while physical guidance directed the desired response. Subsequent to a correct response, a successively increasing time delay was inserted between the two stimuli. All three profoundly retarded adolescents responded correctly to each verbal instruction only after the item had been trained in a multiple-baseline order. None of the subjects learned a generalized instruction-following skill, in that each instruction needed to be trained and generalization to untrained items did not occur.

Variant findings have been reported by investigators exclusively assessing the generalization of compliance with direct commands. While Whitman et al. (1971) demonstrated that positive reinforcement, physical guidance, and fading promoted a generalization to responses beyond those immediately involved in the training procedure of two severely retarded subjects, Striefel and Wetherby (1973) indicated that the profoundly retarded subject of their study did not respond correctly to generalization items as a function of training other behaviors through similar means.

Another type of generalization that manifests a dynamic impact upon the normalization of handicapped subjects is setting generality. If a child's behavior is a principle function of its short-term environmental consequences and/or antecedents, it could be deduced that the behavior is situation-specific (Wahler, 1969b). In a precursory assessment of setting generality, Wahler (1969b) analyzed the influence of behavior management performed in the home on subject's behavior at school. Contingencies parentally implemented in the homes of two boys with psychological problems effected changes in the desired direction; however, the children's behavior in the school setting remained uneffected. Only when analogous contingencies were enacted in the school were changes in behavior noted in this setting.

Lovaas et al. (1965) conducted a three phase experiment to build social behavior in 5 year old severely retarded, autistic, and schizophrenic twins. Each phase demonstrated successively greater modifications of aberrant behavior with the use of electric shock for noncompliance and cessation of shock for responsiveness to the experimenter. While shock training had a generalized effect in eliciting other non-specified social behaviors in the experimental setting, additional training was required to transfer these behaviors to other settings (e.g., the ward).

In a comparative study, Haring, White, and Liberty (1978) analyzed the effects of short and long session training upon the compliance of three autistic and severely handicapped youngsters. In one experiment, subjects received short session training in compliance (10 trials) at the beginning of the school day. Compliance to commands within 5 seconds improved during the short sessions, but did not effect congruent changes in the classroom. In a second experiment, identical consequences (i.e., food and praise for compliance and physical guidance for noncompliance) were applied to all commands throughout the day, producing increased levels and predictability of compliance. Since full day training generated greater changes in classroom compliance, these authors hypothesized that for severely handicapped children contingencies for compliance and noncompliance need to be operating throughout the day.

Haring et al. (1977) examined three discrete categories of generalization: generalization across persons, generalization across stimuli, and generalization across behavior. Three severely handicapped subjects generalized most frequently to new stimuli presented by the trainer (i.e., "Do this" and a model replaced "Stand up"), one to another person, and another to a new response behavior that had never been requested but was in the subject's repertoire of skills. Researchers inferred that generalization across these categories may be subject-specific; that is, the conditions associated with a particular category of generalization may be more amenable to the transfer of learning for one subject than another.

Finally, Mithaug (1979) compared the effectiveness of two potentially positively reinforcing procedures (i.e., social and edible reinforcement) and two potentially punishing procedures (i.e., nagging tapping and a neck pressure grip) on decreasing response latencies in three severely retarded women. Two subjects accelerated their task sorting behavior in response to the negative

tapping procedure, the other, to the negative neck pressure procedure. In a follow-up of generalization, the procedures that evidenced control over behavior were employed by other managers working on variations of the same task, different tasks in the same situation, and different tasks in different situations. After several months of gradual fading of the aversive procedures, two of the subjects had increased the variety and accuracy of sorted objects and further decreased response latencies in the absence of prompts or taps. The third subject generalized responding to other vocational, academic, and motoric tasks under a less intrusive form of intervention.

In the above account of generalization research, the predominance of studies explored the transfer of compliant responding across behaviors. Non-handicapped subjects conveyed compliance to unreinforced commands when reinforcements for other members of the class of instruction-following behavior were dispensed. Yet examinations of generalization with handicapped populations, specifically the severely and profoundly retarded group, evidenced a disparity of findings. Many documented no occurrence of generalized behavior, while affirmative reports indicated a highly selective nature of the subjects to transfer abilities across people, behaviors, settings, or time. A number of subjects more readily generalized to new behaviors (Baer, Peterson, & Sherman, 1967; Whitman et al. 1971), some to new trainers (Mithaug, 1979), others to new stimuli (Haring et al., 1977), and still more to new settings (Mithaug, 1979). A collective analysis confirms the discriminative effects of generalization upon the subject and suggests the need to extend or modify intervention strategies to complete training in each category of generalization. Thus, the assumption postulated by Stokes and Baer (1977) that generalization should be treated as an operant response, not merely a conceivable outcome of a particular behavioral change, remains a cogent standard of educational practice.

Summary

Compliance, a behavior which may operationally be defined as appropriate following of an instruction to perform a specific response within a reasonable or designated period of time, can be theoretically conceptualized as a skill to be developed along a learning gradient. First, the individual must acquire an awareness of the request/response interaction and actualize the appropriate role within that exchange. Further, such reciprocity, once established, requires consistency of performance to sustain instructional control and behavioral stability. Finally, the skill of compliance cannot be contended until the individual demonstrates generalized responding across people, time, settings, and behaviors. An analytic review of the literature on noncompliance has been conducted to illustrate a hierarchical training progression and infer differential technological approaches that may be most effectively programmed at each phase with varying populations.

Individuals who are targeted for research addressing the acquisition of compliance fall into at least three categories: those who may comprehend the request but exhibit phlegmatic or reclusive reactions to instruction, those who have not established their role in request/response interactions, and those who are unable to comprehend the requests. For these subjects, training requires staunch adherence to a basic pattern of instruction to facilitate responding (Haring et al., 1977), namely, issue a command, allow a fixed duration of latency by which the subject is to reply, and immediately consequate compliant and noncompliant responding. More specifically, changes reported in noncompliant individuals are preponderantly attributable to succinct two to four word requests, designated latencies of 5 seconds, contingent social (e.g., praise) and primary (e.g., food) reinforcement for compliance, and physical guidance for motoric noncompliance or timeout for verbal noncompliance.

Subsequent to the establishment of appropriate responding, focus must be

directed toward consistency of performance. At the fluency phase of learning, an individual can comprehend and perform the request but refuses to do so consistently. Research directed at this phase attracts a more expansive audience, since this misbehavior pervades the spectrum of populations. Consequently, a myriad of management techniques have been implemented to actuate desired effects. The techniques disclosed in this review of the literature include the contingent positive approaches of differential social attention, token economy systems, and application of the Premack principle as well as the aversive approaches of response cost, reprimand, timeout, and physical manipulations involving guidance, overcorrection, tapping, and pressure grips. While each of these procedures has met with varying degrees of success with differing populations, all require critical examination prior to implementation. To emphasize this point, consider the effects of the seemingly simple and naturalistic procedure of differential social reinforcement, for example. With some subjects this technique has evidended desired results (Goetz et al., 1975), with others ineffectiveness (Wahler, 1969a), and with still more, emotive reaction (Sajwaj et al., 1972). In view of the variant results of research findings, uniform implementation of a particular technique is not endorsed and demands selective specification based upon the subject's characteristics, environment, and treatment history. However, to facilitate appropriate selection of individualized programs, cautions and considerations of discrete techniques have been proposed and implications advanced within the context of this report.

An alternative to consequent controls of behavior which has recently kindled interest is the manipulation of antecedents. Preliminary investigation into the controlling potential of these variables (e.g., instruction) on the compliant behavior of handicapped and non-handicapped subjects have been optimistic. Thus, a pragmatic programming model may be suggested, entailing a hierarchical plan

of action. Antecedent manipulation, necessitating mere adaptions to the ongoing curriculum would precede consequent manipulations that demand additional management programs and contingencies. This parsimonious approach precludes amalgamative treatment efforts until individual variables have been documented as ineffective. Yet when required, dual program foci may call for application of the data-based decision rule to determine further modification of variables (see Haring, White, & Liberty, 1980 for a thorough description of this rule). The possibility exists, however, that the austerity and encompassment of programs employed to accelerate compliance will be proportionate to the severity of handicap of the subject(s) under treatment, patterning research to date.

Many training programs precipitiously concluded upon attainment of compliance within the regimens of the training condition. To suggest closure at this point excludes the imperative of training generalized responding across time, settings, people, and behaviors. For it is the generalization of performance which promotes comprehensive ability and thereby allows greater independence.

In studies which have pursued the issue, a disparity of findings among and between populations has been noted. Researchers have documented the likelihood of easier generalization with non-handicapped individuals (Waxler & Yarrow, 1970) and more difficult generalization with handicapped individuals (Striefel et al., 1974; Wahler, 1969b), yet ideosyncratic reactions have been noted across subjects. For instance, non-handicapped subjects readily transferred imitative responding across persons and behaviors, but some faltered when activity contexts changed in a study by Waxler and Yarrow (1970). However, in handicapped subjects, the degree of discrepancy ranging from a lack of generalization to highly selective generalization is paramount to program planning. For the present, a closer approximation of appropriate programming for handicapped individuals would

incorporate the deliberate assessment and, where required, training in each category of generalization to realize the veritable skill of compliance.

Reference Note

1. Schoen, S. F. Decreasing noncompliance in a severely multihandicapped child. Paper presented at the national conference of the Association for the Severely Handicapped, Denver, Colorado, 1982.

References

Ayllon, T., & Azrin, N. H. Reinforcement and instructions with mental patients. Journal of the Experimental Analysis of Behavior, 1964, 7, 327-331.

Ayllon, T., & Michael, J. The psychiatric nurse as a behavioral engineer. Journal of the Experimental Analysis of Behavior, 1959, 2, 323-334.

Azrin, N., & Powers, M. Eliminating classroom disturbances of emotionally disturbed children by positive practice procedures. Behavior Therapy, 1975, 6, 525-534.

Baer, A., Rowbury, T., & Baer, D. The development of instructional control over classroom activities of deviant preschool children. Journal of Applied Behavior Analysis, 1973, 6, 289-298.

Baer, D., Peterson, R., & Sherman, J. The development of imitation by reinforcing behavioral similarity to a model. Journal of the Experimental Analysis of Behavior, 1967, 10, 405-416.

Baron, A., Kaufman, A., & Stauber, K. Effects of instructions and reinforcement-feedback on human operant behavior maintained by fixed-interval reinforcement. Journal of the Experimental Analysis of Behavior, 1969, 12, 701-712.

Barton, E., Guess, D., Garcia, E., & Baer, D. Improvement of retardates' mealtime behaviors by timeout procedures using multiple baseline techniques. Journal of Applied Behavior Analysis, 1970, 3, 77-84.

Berman, M. Instruction and behavior change: A taxonomy. Exceptional Children, 1973, 39, 644-650.

Birnbrauer, J., Wolf, M., Kidder, J., & Tague, C. Classroom behavior of retarded pupils with token reinforcement. Journal of Experimental Child Psychology, 1965, 2, 219-235.

Bostow, D., & Bailey, J. Modification of severe disruptive and aggressive behavio. using brief timeout and reinforcement procedures. Journal of Applied Behavior Analysis, 1969, 2, 31-37.

Budd, K., Green, D., & Baer, D. An analysis of multiple misplaced parental programmed environment. Journal of Applied Behavior Analysis, 1972, 5, 271-282.

Burchard, J., & Barrera, F. An analysis of timeout and response cost in a programmed environment. Journal of Applied Behavior Analysis, 1972, 5, 271-282.

Carnine, D. Effects of two teacher-presentation rates on off-task behavior, answering correctly, and participation. Journal of Applied Behavior Analysis, 1976, 9, 199-206.

Christophersen, E., Arnold, C., Hill, D., & Quilitch, H. The home point system: Token reinforcement procedures for application by parents of children with behavior problems. Journal of Applied Behavior Analysis, 1972, 5, 485-497.

Doleys, D., Wells, K., Hobbs, S., Roberts, M., & Cartelli, L. The effects of social punishment on noncompliance: A comparison with timeout and positive practice. Journal of Applied Behavior Analysis, 1976, 9, 471-482.

Fjellstedt, N., & Sulzar-Azaroff, B. Reducing the latency of a child's responding to instructions by means of a token system. Journal of Applied Behavior Analysis, 1973, 6, 125-130.

Foxx, R. Attention training: The use of overcorrection avoidance to increase the eye contact of autistic and retarded children. Journal of Applied Behavior Analysis, 1977, 10, 489-499.

Gaylord-Ross, R. A decision model for the treatment of aberrant behavior in applied settings. In W. Sailor, B Wilcox, & L. Brown (Eds.), Methods of instruction for severely handicapped students. Baltimore, Maryland: Paul H. Brookes Publishers, 1980.

Goetz, E., Holmberg, M., & Le Blanc, J. Differential reinforcement of other behavior and noncontingent reinforcement as control procedures during the modification of a preschooler's compliance. Journal of Applied Behavior Analysis, 1975, 8, 77-82.

Gresham, F. Comparison of response cost and timeout in a special education setting. The Journal of Special Education, 1979, 13, 199-208.

Haring, N. G., White, O. R., & Liberty, K. A. An investigation of phases of learning and facilitating instructional events for the severely handicapped: Annual progress report 1976-77. Bureau of Education for the Handicapped, Project No. 443CH70564, University of Washington, College of Education, Seattle, 1977.

Haring, N. G., White, O. R., & Liberty, K. A. An investigation of phases of learning and facilitating instructional events for the severely handicapped: Annual progress report 1977-78. Bureau of Education for the Handicapped, Project No. 443CH70564, University of Washington, College of Education, Seattle, 1978.

Haring, N. G., White, O. R., & Liberty, K. A. Rules for data-based strategy decisions in instructional programs: Current research and instructional implications. In W. Sailor, B. Wilcox, & L. Brown (Eds.), Methods of instruction for severely handicapped students. Baltimore, Maryland: Paul H. Brookes Publishers, 1980.

Herbert, E., Pinkston, E., Hayden, M., Sajwaj, T., Pinkston, S., Cordua, G., & Jackson, C. Adverse effects of differential parental attention. Journal of Applied Behavior Analysis, 1973, 6, 15-30.

Homme, L., deBaca, P., Devine, J., Steinhorst, R., & Rickert, E. Use of the Premack principle in controlling the behavior of nursery school children. Journal of the Experimental Analysis of Behavior, 1963, 6, 544.

Lovaas, O., Schaeffer, B., & Simmons, J. Building social behavior in autistic children by use of electric shock. Journal of Experimental Research in Personality, 1965, 1, 99-109.

Martin, J. The control of imitative and nonimitative behaviors in severely retarded children through "generalized-instruction following". Journal of Experimental Child Psychology, 1971, 11, 390-400.

McReynolds, L. Application of timeout from positive reinforcement for increasing the efficiency of speech training. Journal of Applied Behavior Analysis, 1969, 2, 199-205.

Mithaug, D. A comparison of procedures to increase responding in three severely retarded, noncompliant young adults. AAESPH Review, 1979, 4, 66-80.

O'Leary, K., & Becker, W. The effects of the intensity of a teacher's reprimands on children's behavior. Journal of School Psychology, 1969, 7, 8-11. (a)

O'Leary, K., Becker, W., Evans, M., & Saudargas, R. A token reinforcement program in a public school: A replication and systematic analysis. Journal of Applied Behavior Analysis, 1969, 2, 3-13. (b)

O'Leary, K., Kaufman, K., Kass, R., & Drabman, R. The effects of loud and soft reprimands on the behavior of disruptive students. Exceptional Children, 1970, 37, 145-155.

Plummer, S., Baer, D., & Le Blanc, J. Functional considerations in the use of procedural timeout and an effective alternative. Journal of Applied Behavior Analysis, 1977, 10, 689-705.

Sajwaj, T., Twardosz, S., & Burke, M. Side effects of extinction procedures in a remedial preschool. Journal of Applied Behavior Analysis, 1972, 5, 163-175.

Scarboro, M., & Forehand, R. Effects of two types of response-contingent time-out on compliance and oppositional behavior of children, Journal of Experimental Child Psychology, 1975, 19, 252-264.

Schutte, R., & Hopkins, B. The effects of teacher attention on following instructions in a kindergarten class. Journal of Applied Behavior Analysis, 1970, 3, 117-122.

Snell, M. Systematic instruction of the moderately and severely handicapped. Columbus, Ohio: Charles E. Merrill Publishing Co., 1978.

Stokes, T., & Baer, D. An implicit technology of generalization. Journal of Applied Behavior Analysis, 1977, 10, 349-367

Striefel, S., Bryan, K., & Aikins, D. Transfer of stimulus control motor to verbal stimuli. Journal of Applied Behavior Analysis, 1974, 7, 123-135.

Striefel, S., & Wetherby, B. Instruction-following behavior of a retarded child and its controlling stimuli. Journal of Applied Behavior Analysis, 1973, 6, 663-670.

Wahler, R. Oppositional children: A quest for parental reinforcement control. Journal of Applied Behavior Analysis, 1969, 2, 159-170. (a)

Wahler, R. Setting generality: Some specific and general effects of child behavior therapy. Journal of Applied Behavior Analysis, 1969, 2, 239-246. (b)

Waxler, C., & Yarrow, M. Factors influencing imitative learning in preschool children. Journal of Experimental Child Psychology, 1970, 9, 115-130.

Wehman, P., & McLaughlin, P. Teachers' perceptions of behavior problems with severely and profoundly handicapped students. Mental Retardation, 1979, 1, 20-21.

White, G., Nielsen, G., & Johnson, S. Timeout duration and the suppression of deviant behavior in children. Journal of Applied Behavior Analysis, 1972, 5, 111-120.

Whitman, T., Zakaras, M., & Chardos, S. Effects of reinforcement and guidance procedures on instruction-following behavior of severely retarded children. Journal of Applied Behavior Analysis, 1971, 4, 283-290.

Zeilberger, J., Sampen, S., & Sloane, H. Modification of a child's problem behaviors in the home with the mother as therapist. Journal of Applied Behavior Analysis, 1968, 1, 47-53.

Zimmerman, E., Zimmerman, J., & Russell, C. Differential effects of token reinforcement on instruction-following behavior in retarded students instructed as a group. Journal of Applied Behavior Analysis, 1969, 2, 101-112.